

IN THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) An antenna for at least one of transmitting ~~and~~ receiving electromagnetic waves, comprising:

~~_____~~ several electric dipoles, ~~characterized in that the dipoles are being arranged in pairs of oppositely located dipoles, that the two dipoles of each pair are at least one of radiating or and receiving with approximately the same amplitude and phase, that at least some of said dipole pairs have having different properties, and preferably different dimensions or orientations, and that they are the dipoles being arranged in such a way that the geometrical centres of each dipole pair are at least approximately coinciding.~~

2. (Currently Amended) An antenna according to claim 1, wherein all dipole pairs are oriented in one direction in order to at least one of transmit ~~and~~ receive waves of one linear polarization.

3. (Currently Amended) An antenna according to claim 1, wherein approximately half the dipole pairs are oriented in one direction and the rest in an orthogonal direction, in order to at least one of transmit ~~or and~~ receive waves of at least one of dual linear polarization ~~or and~~ circular polarization.

4. (Currently Amended) An antenna according to ~~any one of the preceding claims~~ claim 1, wherein the dipoles are located above a conducting body acting as a ground plane.

5. An antenna according to claim 4, wherein the metal lines connecting neighbouring dipoles do not cross each other.

6. (Currently Amended) An antenna according to claim 4 ~~or 5~~, wherein the conducting body located under the dipoles and acting as a ground plane is non-flat.

7. (Currently Amended) An antenna according to ~~any one of the preceding claims~~ claim 1, wherein the dipoles are at least one of V-shaped ~~or and~~ curved.

8. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1, wherein the dipoles are made of at least one of conducting wires, tubes ~~or and~~ strips.

9. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1, wherein the dipoles are made by conducting strips on a dielectric substrate.

10. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1, wherein the dipoles are excited by connecting together the endpoints of neighbouring parallel dipoles so that they form serpentine-shaped lines from ~~one or more~~at least one feed points.

11. (Currently Amended) An antenna according to ~~any one of claims 1 to 9~~claim 1, wherein at least one dipole comprises two oppositely directed conducting arms with a feed gap between them, ~~and preferably several dipoles, and most preferably essentially all dipoles.~~

12. (Currently Amended) An antenna according to claim 11, wherein each dipole arm comprises at least two ~~or more~~ conducting lines that are connected together at at least one ~~or more~~ points or over an extended part of the arm.

13. (Currently Amended) An antenna according to claims 11 ~~or 12~~, wherein the feed gaps of neighbouring dipoles of different dipole pairs are excited by two-conductor feed lines starting from at least one ~~or more~~ feed points.

14. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1s, wherein each dipole ~~consists of~~includes two opposite arms, and each dipole arm comprises two conducting lines that are connected at the outer end whereas the inner end at a feed gap is connected with the inner end of the closest line of at least one of a neighbouring inner ~~or and~~ outer dipole arm, so that one set of dipoles with feed lines are formed by two opposing serpentine-shaped lines.

15. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1, wherein the dimensions of each dipole pair are essentially as follows: dipole length approximately 0.5 wavelengths, dipole height over ground between 0.05 and 0.30 wavelengths, and dipole spacing approximately 0.5 wavelengths, where the wavelengths is for that frequency of which the given dipole pair is the dominating contributor to the radiation pattern.

16. (Currently Amended) An antenna according to ~~any one of the preceding~~ claim 1, wherein the dimensions of the different dipole pairs varies in a log-periodic manner in order to make a very broadband overall performance.

17. (Currently Amended) An antenna according to ~~any one of the preceding~~ claim 1, wherein the radiation patterns have an almost constant beam width over a very wide frequency band that may be several octaves.

18. (Currently Amended) An antenna according to ~~any one of the preceding~~ claim 1, wherein the antenna is used to illuminate at least one of a single or and dual reflector antenna system.

19. (Currently Amended) An antenna according to ~~any one of the preceding~~ claim 1, wherein at least one balun is arranged in the central region between a pair of dipoles, ~~and preferably between the smallest dipoles.~~

20. (Currently Amended) An antenna according to ~~any one of the preceding~~ claim 1, wherein at least one 180 deg hybrid is arranged in the central region between a pair of dipoles, ~~and preferably between the smallest dipoles.~~

21. (Currently Amended) An antenna according to ~~claims 19 or 20~~, wherein at least one of the balun or and 180 deg hybrid is realized as an active circuit including transistor amplifiers.

22. (Currently Amended) An antenna according to ~~claims 19, 20 or 21, as dependent on any one of claims 4-6, wherein the dipoles are located above a conducting body acting as a ground plane and wherein at least one of the balun and or 180 deg hybrid is located behind the ground plane in the central region with transmission lines providing the connection through the ground plane.~~

23. (Currently Amended) An antenna according to ~~any one of the preceding~~ claim 1, wherein at least one dipole comprises two oppositely directed conducting arms with a feed gap between them, and wherein the feed gaps of neighbouring dipoles of different dipole pairs are excited by a two-conductor feed line starting from at least one or more feed points, the two separate conductors of the two-conductor feed line being arranged in at least two different, non-intersecting planes.

24. An antenna according to claim 23, wherein the two-conductor feed line comprise a first conductor in a first plane, and a second conductor at least partly arranged in a second plane, said first and second planes being different and non-intersecting to each other.

25. An antenna according to claim 24, wherein at least part of the dipole arms are arranged in said first plane.

26. (Currently Amended) An antenna according to claim 24 ~~or 25~~, wherein the dipoles are made by conducting strips on a dielectric substrate, and wherein the first and second planes are arranged on different sides of said substrate.

27. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1, wherein essentially all dipoles are arranged on one side of a substrate, and a first conductor of a two-conductor feed line is arranged on this side of the substrate, whereas a second conductor of said two-conductor feed line is arranged at least partly on an opposite side of the substrate, and being connected to the dipoles through the substrate.

28. An antenna according to claim 27, wherein the second conductor connects dipoles within at least some of the dipole pairs to each other, said dipole pairs thereby being excited by electromagnetic coupling to neighbouring dipoles.

29. (Currently Amended) An antenna according to ~~any one of the claims 1-26~~claim 1, wherein for at least some of the dipoles, ~~and preferably essentially all the dipoles,~~ the dipoles' arms are arranged on opposite sides of a substrate, and wherein a separate conductor of a two-conductor feed line is arranged on each side for exciting the dipole arms arranged on said sides.

30. (Currently Amended) An antenna according to ~~any one of the claims 1-26~~claim 1, wherein essentially all dipole arms are arranged on one side of a substrate, and the conductors of a feed line are wound in parallel on a dielectric rod so that different windings of the lines are connected to different dipole arms.

31. (Currently Amended) An antenna according to ~~any one of the preceding claims~~claim 1, wherein at least some of the dipole pairs have dipoles being connected to separate feed lines.

32. (Currently Amended) An antenna according to ~~any one of the preceding~~
~~claims~~claim 1, wherein at least some neighbouring dipole pairs are connected to separate feed
lines.